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L1: Entry 3 of 8

File: JPAB

Jun 15, 1999

PUB-NO: JP411158138A

DOCUMENT-IDENTIFIER: JP 11158138 A

TITLE: PHENYL BENZOATE DERIVATIVE AND LIQUID CRYSTAL COMPOSITION CONTAINING THE SAME

PUBN-DATE: June 15, 1999

## INVENTOR-INFORMATION:

NAME

COUNTRY

TAKEHARA, SADA0

OSAWA, MASASHI

TAKATSU, HARUYOSHI

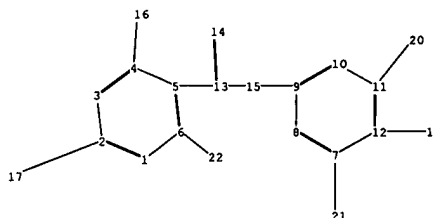
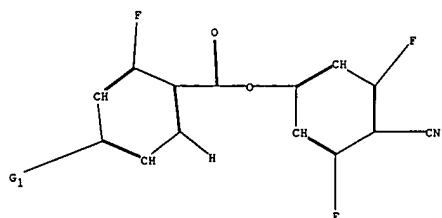
INT-CL (IPC): C07 C 255/55; C09 K 19/20; G02 F 1/13

## ABSTRACT:

PROBLEM TO BE SOLVED: To obtain the subject new compound having extremely large dielectric anisotropy and capable of being added to liquid crystal compositions to highly reduce their threshold values without deteriorating their responsibility.

SOLUTION: A phenyl benzoate derivative of formula I [R is a 1-7C linear alkyl; (n) is an integer of 1-5; X and Y are each independently H or F atom]. For example, 2,6-difluoro-4-methoxymethylbenzoic acid 3-fluoro-4-cyanophenyl ester. The compound of formula I can easily be obtained, for example, by converting a 4-alkoxyalkyl-2,6-difluorobenzoic acid of formula II into the corresponding acid chloride by use of thionyl chloride as a chlorinating agent, and subsequently allowing the acid chloride to react with a cyanophenol of formula III or its fluorine-substituted produce in the presence of a base such as pyridine. The employment of the compound of formula I enables the production of liquid crystal compositions suitable for STN liquid crystal displays.

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chain nodes :

13 14 15 16 17 18 20 21 22

ring nodes :

1 2 3 4 5 6 7 8 9 10 11 12

chain bonds :

2-17 4-16 5-13 6-22 7-21 9-15 11-20 12-18 13-14 13-15

ring bonds :

1-2 1-6 2-3 3-4 4-5 5-6 7-8 7-12 8-9 9-10 10-11 11-12

exact/norm bonds :

2-17 9-15 13-14 13-15

exact bonds :

4-16 5-13 6-22 7-21 11-20 12-18

normalized bonds :

1-2 1-6 2-3 3-4 4-5 5-6 7-8 7-12 8-9 9-10 10-11 11-12

G1:C,H,O

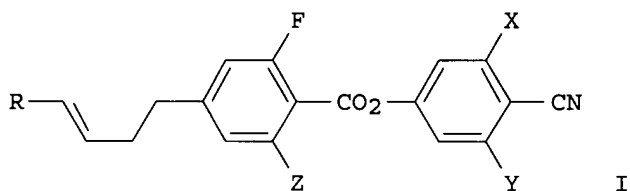
Match level :

1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom 11:Atom  
 12:Atom 13:CLASS 14:CLASS 15:CLASS 16:CLASS 17:CLASS 18:CLASS 20:CLASS 21:CLASS  
 22:CLASS

AN 1999:355610 CAPLUS  
 DN 130:359392  
 TI Cyanophenyl alkenylfluorobenzoate derivative for nematic liquid crystal composition for display device  
 IN Takeuchi, Kiyofumi; Takatsu, Haruyoshi; Takehara, Sadao; Osawa, Masashi  
 PA Dainippon Ink and Chemicals, Inc., Japan  
 SO Eur. Pat. Appl., 94 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA English  
 IC ICM C07C069-94  
 ICS C07C063-64; C09K019-20; C09K019-46  
 CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 Section cross-reference(s): 25, 75

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 919536	A1	19990602	EP 1998-122504	19981127
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2000129260	A2	20000509	JP 1998-308405	19981029
	JP 11228520	A2	19990824	JP 1998-334060	19981125
	CN 1227838	A	19990908	CN 1998-126964	19981127
	US 6287646	B1	20010911	US 1998-200848	19981130
	US 2002053659	A1	20020509	US 2001-826903	20010406
PRAI	JP 1997-327904	A	19971128		
	JP 1998-308405	A	19981029		
	US 1998-200848	A3	19981130		
OS	MARPAT 130:359392				
GI					



AB A novel liq. crystal compd., a nematic liq. crystal compn., and an electrooptical display device using the liq. crystal compn. are disclosed. The liq. crystal compd. is represented by the general formula I wherein R represents a hydrogen atom or a straight-chain alkyl group having 1 to 7 carbon atoms and each of X, Y and Z independently represents a hydrogen or fluorine atom.

ST cyanophenyl alkenylfluorobenzoate liq crystal display device

IT Liquid crystal displays  
 (nematic liq. crystal compns. contg. cyanophenyl alkenylfluorobenzoate derivs. for)

IT 139443-68-8 139443-69-9 145918-41-8 155266-68-5 225240-54-0  
 225240-70-0 225240-72-2 225240-73-3 225240-74-4  
 225240-75-5 225240-76-6 225240-80-2  
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
 (electrooptical display devices with nematic liq. crystal compns. contg.)

IT 32085-88-4P 79538-20-8P 141776-91-2P 225240-58-4P 225240-59-5P  
 225240-61-9P 225240-63-1P 225240-64-2P 225240-65-3P 225240-66-4P  
 225240-68-6P 225240-69-7P  
 RL: RCT (Reactant); SPN (Synthetic preparation); TEM (Technical or

engineered material use); PREP (Preparation); RACT (Reactant or reagent);  
USES (Uses)

(prepn. and reaction in prepg. liq. crystals for electrooptical display  
devices)

IT 225240-47-1P 225240-49-3P

RL: DEV (Device component use); SPN (Synthetic preparation); TEM  
(Technical or engineered material use); PREP (Preparation); USES (Uses)  
(prepn. and use in nematic liq. crystal compns. for electrooptical  
display devices)

IT 461-96-1 82380-18-5 194487-85-9

RL: RCT (Reactant); TEM (Technical or engineered material use); RACT  
(Reactant or reagent); USES (Uses)

(reaction in prepg. liq. crystals for electrooptical display devices)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Chisso; JP 09059637 A CAPLUS
- (2) Chisso Corp; EP 0700982 A 1996 CAPLUS
- (3) Chisso Corp; EP 0750028 A 1996 CAPLUS
- (4) Hoffmann La Roche; EP 0464648 A 1992 CAPLUS
- (5) Matsushita, T; JP 09059637 A Database Chemabs CAPLUS

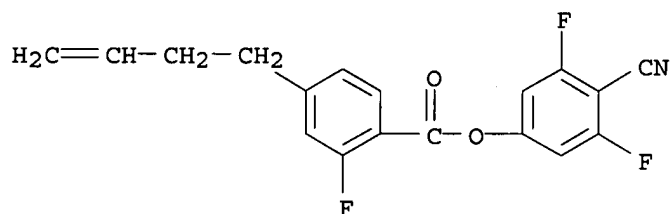
IT 225240-70-0

RL: DEV (Device component use); TEM (Technical or engineered material  
use); USES (Uses)

(electrooptical display devices with nematic liq. crystal compns.  
contg.)

RN 225240-70-0 CAPLUS

CN Benzoic acid, 4-(3-butenyl)-2-fluoro-, 4-cyano-3,5-difluorophenyl ester  
(9CI) (CA INDEX NAME)



L4 ANSWER 1 OF 15 CAPLUS COPYRIGHT 2003 ACS  
 AN 2002:889049 CAPLUS  
 DN 137:391146  
 TI Electro-optic light control element, display and medium  
 IN Heckmeier, Michael; Goetz, Achim  
 PA Merck Patent G.m.b.H., Germany  
 SO PCT Int. Appl., 87 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA German  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002093244	A2	20021121	WO 2002-EP4300	20020418
	W:				
	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW:				
	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	DE 10217273	A1	20021205	DE 2002-10217273	20020418
PRAI	DE 2001-10124040	A	20010516		

L4 ANSWER 2 OF 15 CAPLUS COPYRIGHT 2003 ACS  
 AN 2002:464298 CAPLUS  
 DN 137:54731  
 TI Liquid crystal compositions and high-contrast superstretched nematic liquid crystal displays therewith  
 IN Sudo, Takeshi; Kawakami, Shotaro; Onishi, Hiroyuki; Takeuchi, Kiyofumi; Takatsu, Haruyoshi  
 PA Dainippon Ink and Chemicals, Inc., Japan  
 SO Jpn. Kokai Tokkyo Koho, 20 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002173680	A2	20020621	JP 2000-369991	20001205
PRAI	JP 2000-369991		20001205		
OS	MARPAT 137:54731				

L4 ANSWER 3 OF 15 CAPLUS COPYRIGHT 2003 ACS  
 AN 2002:169170 CAPLUS  
 DN 136:224296  
 TI Supertwisted nematic liquid crystal display with reduced temperature and frequency dependence of threshold voltage  
 IN Sudo, Go; Kuriyama, Takeshi; Kawakami, Shotaro; Ohnishi, Hiroyuki; Takatsu, Haruyoshi  
 PA Dainippon Ink and Chemicals, Inc., Japan  
 SO Eur. Pat. Appl., 18 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA English  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1184441	A1	20020306	EP 2001-120612	20010829
	R:				
	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				

US 6562421 B2 20030513 US 2001-940670 20010829  
 CN 1342912 A 20020403 CN 2001-137108 20010831  
 JP 2002146356 A2 20020522 JP 2001-263664 20010831  
 JP 2002146357 A2 20020522 JP 2001-263665 20010831  
 PRAI JP 2000-262851 A 20000831  
 OS MARPAT 136:224296  
 RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 4 OF 15 CAPLUS COPYRIGHT 2003 ACS  
 AN 2001:597947 CAPLUS  
 DN 135:187794  
 TI Benzoic acid esters, and liquid-crystalline medium  
 IN Goulding, Mark; Adlem, Kevin; Tanner, Richard; Ionescu, Doina; Francis, Matthew; Coates, David; Reiffenrath, Volker; Hirschmann, Harald  
 PA Merck Patent G.m.b.H., Germany  
 SO PCT Int. Appl., 63 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001058858	A1	20010816	WO 2000-EP13239	20001222
W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
EP 1254107	A1	20021106	EP 2000-987454	20001222
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
PRAI EP 2000-102142	A	20000207		
WO 2000-EP13239	W	20001222		

OS MARPAT 135:187794  
 RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 5 OF 15 CAPLUS COPYRIGHT 2003 ACS  
 AN 2001:442315 CAPLUS  
 DN 135:53852  
 TI Bistable liquid crystal compositions and low-threshold reflective liquid crystal displays therewith  
 IN Iwamatsu, Masako; Kobayashi, Nobuyuki; Ueda, Hideaki  
 PA Minolta Camera Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 26 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001164253	A2	20010619	JP 2000-298853	20000929
PRAI JP 1999-279501	A	19990930		

L4 ANSWER 6 OF 15 CAPLUS COPYRIGHT 2003 ACS  
 AN 2001:207972 CAPLUS  
 DN 134:245305  
 TI Liquid crystal composition suitable for super twisted nematic mode liquid crystal display element

IN Fujita, Hiroaki; Murashiro, Katsuyuki; Nakagawa, Etsuo  
PA Chisso Corporation (Sadao Nogi), Japan  
SO Eur. Pat. Appl., 32 pp.  
CODEN: EPXXDW

DT Patent  
LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1085073	A1	20010321	EP 2000-119444	20000914
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2001081467	A2	20010327	JP 1999-260347	19990914
	US 6500502	B1	20021231	US 2000-661787	20000914
PRAI	JP 1999-260347	A	19990914		
OS	MARPAT 134:245305				

RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 7 OF 15 CAPLUS COPYRIGHT 2003 ACS

AN 1999:355610 CAPLUS

DN 130:359392

TI Cyanophenyl alkenylfluorobenzoate derivative for nematic liquid crystal composition for display device

IN Takeuchi, Kiyofumi; Takatsu, Haruyoshi; Takehara, Sadao; Osawa, Masashi

PA Dainippon Ink and Chemicals, Inc., Japan

SO Eur. Pat. Appl., 94 pp.

CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 919536	A1	19990602	EP 1998-122504	19981127
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2000129260	A2	20000509	JP 1998-308405	19981029
	JP 11228520	A2	19990824	JP 1998-334060	19981125
	CN 1227838	A	19990908	CN 1998-126964	19981127
	US 6287646	B1	20010911	US 1998-200848	19981130
	US 2002053659	A1	20020509	US 2001-826903	20010406
PRAI	JP 1997-327904	A	19971128		
	JP 1998-308405	A	19981029		
	US 1998-200848	A3	19981130		

OS MARPAT 130:359392

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 8 OF 15 CAPLUS COPYRIGHT 2003 ACS

AN 1997:540181 CAPLUS

DN 127:154707

TI Nematic liquid crystal composition and liquid crystal device containing said composition

IN Takeuchi, Kiyobumi; Takatsu, Haruyoshi; Ishida, Tokue

PA Dainippon Ink and Chemicals, Inc., Japan

SO Jpn. Kokai Tokkyo Koho, 14 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09157654	A2	19970617	JP 1995-324467	19951213
PRAI	JP 1995-324467		19951213		

OS MARPAT 127:154707

L4 ANSWER 9 OF 15 CAPLUS COPYRIGHT 2003 ACS

AN 1997:48492 CAPLUS

DN 126:59727

TI Preparation of fluorine-substituted benzene derivatives as liquid-crystal composition for liquid-crystal display devices

IN Kondo, Tomoyuki; Haseba, Yasuhiro; Koizumi, Yasuyuki; Miyazawa, Kazutoshi; Hachiya, Norihisa; Nakagawa, Etsuo

PA Chisso Corp., Japan

SO PCT Int. Appl., 149 pp.

CODEN: PIXXD2

DT Patent

LA Japanese

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9632365	A1	19961017	WO 1996-JP1010	19960412
	W: AU, CA, CN, JP, KR, RU, SG, US, VN				
	RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	AU 9652885	A1	19961030	AU 1996-52885	19960412
	EP 820976	A1	19980128	EP 1996-909354	19960412
	EP 820976	B1	20010221		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
	CN 1184462	A	19980610	CN 1996-193858	19960412
	CN 1088453	B	20020731		
	JP 3025534	B2	20000327	JP 1996-530886	19960412
	AT 199242	E	20010315	AT 1996-909354	19960412
	US 6051288	A	20000418	US 1997-913022	19970926
PRAI	JP 1995-112551	A	19950412		
	WO 1996-JP1010	W	19960412		
OS	MARPAT 126:59727				

L4 ANSWER 10 OF 15 CAPLUS COPYRIGHT 2003 ACS

AN 1996:701520 CAPLUS

DN 125:328294

TI Preparation of phenyl benzoates and analogs as liquid crystal components

IN Kondo, Tomoyuki; Matsui, Shuichi; Koizumi, Yasuyuki; Shibata, Koichi; Haseba, Yasuhiro; Hachiya, Norihisa; Nakagawa, Etsuo; Miyazawa, Kazutoshi

PA Chisso Corp., Japan

SO Eur. Pat. Appl., 111 pp.

CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 738709	A2	19961023	EP 1996-102672	19960222
	EP 738709	A3	19970716		
	EP 738709	B1	20020123		
	R: AT, BE, CH, DE, ES, FR, GB, IT, LI, NL, SE				
	TW 470768	B	20020101	TW 1995-84106009	19950613
	JP 09031024	A2	19970204	JP 1996-50889	19960213
	JP 09031462	A2	19970204	JP 1996-50890	19960213
	JP 09031463	A2	19970204	JP 1996-50891	19960213
	CN 1136067	A	19961120	CN 1996-105985	19960220
	US 5755994	A	19980526	US 1996-605776	19960222
	US 5820784	A	19981013	US 1996-606032	19960222
	EP 1010687	A2	20000621	EP 2000-103442	19960222
	R: AT, BE, CH, DE, ES, FR, GB, IT, LI, NL, SE				
	AT 212333	E	20020215	AT 1996-102672	19960222
PRAI	JP 1995-59822	A	19950222		
	JP 1995-138625	A	19950512		



EP 1996-102672 A3 19960222  
OS MARPAT 125:328294

L4 ANSWER 11 OF 15 CAPLUS COPYRIGHT 2003 ACS  
AN 1992:623239 CAPLUS  
DN 117:223239  
TI Liquid-crystal phases and display devices  
IN Coates, David; Goulding, Mark; Maden, Shirley; McDonnell, Damien Gerald  
PA Secretary of State for Defence, UK  
SO Brit. UK Pat. Appl., 21 pp.  
CODEN: BAXXDU  
DT Patent  
LA English  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	GB 2250748	A1	19920617	GB 1990-27103	19901213
PRAI	GB 1990-27103		19901213		
OS	MARPAT 117:223239				

L4 ANSWER 12 OF 15 CAPLUS COPYRIGHT 2003 ACS  
AN 1992:561519 CAPLUS  
DN 117:161519  
TI Electrorheological fluid  
IN Lacey, David  
PA UK  
SO Brit. UK Pat. Appl., 21 pp.  
CODEN: BAXXDU  
DT Patent  
LA English  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	GB 2249553	A1	19920513	GB 1991-23713	19911107
PRAI	GB 1990-24408		19901109		
	GB 1991-8105		19910416		

L4 ANSWER 13 OF 15 CAPLUS COPYRIGHT 2003 ACS  
AN 1991:111986 CAPLUS  
DN 114:111986  
TI 4-[2-(trans-4-Alkylcyclohexyl)ethyl]-2-fluorobenzoic acid phenyl esters  
with large dielectric anisotropy and liquid-crystal compositions  
containing them  
IN Suzuki, Toshiharu; Goto, Yasuyuki; Kitano, Yoshimasa  
PA Chisso Corp., Japan  
SO Jpn. Kokai Tokkyo Koho, 10 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 02229139	A2	19900911	JP 1989-50592	19890302
	JP 06069987	B4	19940907		
	US 5069814	A	19911203	US 1990-480118	19900214
PRAI	JP 1989-50592		19890302		
OS	MARPAT 114:111986				

L4 ANSWER 14 OF 15 CAPLUS COPYRIGHT 2003 ACS  
AN 1990:118462 CAPLUS  
DN 112:118462  
TI Preparation of laterally fluorinated 4-cyanophenyl and 4'-cyanobiphenyl  
benzoates as liquid crystal materials  
IN Gray, George William; Lacey, David; Toyne, Kenneth Johnson; Hird, Michael;

McDonnell, Damien Gerard  
 PA United Kingdom Secretary of State for Defence, London, UK  
 SO PCT Int. Appl., 42 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 8908102	A1	19890908	WO 1989-GB178	19890221
	W: GB, JP, KR, US				
	RW: AT, BE, CH, DE, FR, GB, IT, LU, NL, SE				
	EP 407438	A1	19910116	EP 1989-904111	19890221
	EP 407438	B1	19950104		
	R: AT, BE, CH, DE, FR, GB, IT, LI, LU, NL, SE				
	JP 03503637	T2	19910815	JP 1989-503580	19890221
	JP 2863235	B2	19990303		
	CA 1332740	A1	19941025	CA 1989-591980	19890224
	GB 2233649	A1	19910116	GB 1990-18359	19900817
	GB 2233649	B2	19911106		
	US 5156763	A	19921020	US 1990-571590	19900830
	US 5334327	A	19940802	US 1992-881670	19920512
PRAI	GB 1988-4330		19880224		
	WO 1989-GB178		19890221		
	US 1990-571590		19900830		
OS	MARPAT 112:118462				

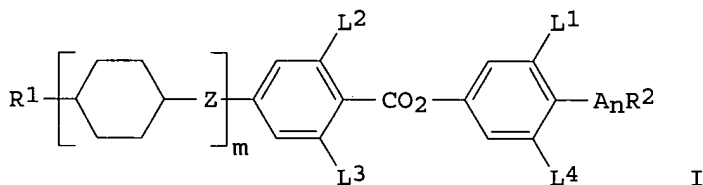
L4 ANSWER 15 OF 15 CAPLUS COPYRIGHT 2003 ACS  
 AN 1989:644891 CAPLUS  
 DN 111:244891

TI The synthesis and transition temperatures of some fluoro-substituted  
 4-cyanophenyl and 4-cyanobiphenyl-4'-yl 4-pentyl- and 4-butoxybenzoates  
 AU Gray, G. W.; Hird, M.; Lacey, D.; Toyne, K J.  
 CS Sch. Chem., Univ. Hull, Hull, HU6 7RX, UK  
 SO Molecular Crystals and Liquid Crystals (1989), 172, 165-89  
 CODEN: MCLCA5; ISSN: 0026-8941  
 DT Journal  
 LA English

AN 1992:417469 CAPLUS  
 DN 117:17469  
 TI Fluorobenzene derivatives and liquid-crystal media and display devices containing them  
 IN Coates, David; Clemitson, Robert William; Hittich, Reinhard; Reiffenrath, Volker; Plach, Herbert; Greenfield, Simon  
 PA Merck Patent Gesellschaft mit Beschraenkter Haftung, Germany  
 SO PCT Int. Appl., 29 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC ICM C09K019-20  
 ICS C09K019-30  
 CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 Section cross-reference(s): 75

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9205230	A2	19920402	WO 1991-EP1727	19910911
	WO 9205230	A3	19930527		
	W: JP, US				
	RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, NL, SE				
	EP 502154	A1	19920909	EP 1991-916316	19910911
	R: DE, GB				
PRAI	DE 1990-9011843		19900926		
	DE 1991-9110641		19910422		
	EP 1990-118432		19900926		
	EP 1991-106411		19910422		
	WO 1991-EP1727		19910911		
OS	MARPAT 117:17469				
GI					



AB The derivs. have the general formula I, where R1 = C1-12 optionally fluorinated alkyl or alkenyl in which 1 or 2 nonadjacent CH2 groups may be replaced by O; A = 1,4-phenylene (optionally substituted with 1 or 2 F) or 1,4-cyclohexylene; Z = COO, CH2O, CH2CH2, (CH2)4, C6H10, (CH2)2C6H10, C6H10(CH2)2, or single bond; L1-4 = H or F; m,n = CN, NCS, F, Cl, QCHoHal3-o, or, when m = 0, also C1-12 alkyl in which 1 or 2 nonadjacent CH2 groups may be replaced by O and/or CH:CH; Q = O or single bond; Hal = F or Cl; and o = 0-2.

ST fluorobenzene deriv liq crystal medium display  
 IT Liquid crystals  
 (fluorobenzene derivs.)  
 IT Optical imaging devices  
 (electro-, liq.-crystal, fluorobenzene derivs. for)  
 IT 348-60-7P 121219-24-7P 121219-25-8P 123843-55-0P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. and reaction of, in formation of fluorobenzene derivs. for liq.-crystal media and display devices)  
 IT 92118-88-2P 123843-77-6P 123843-78-7P 133919-69-4P  
 133919-70-7P 133919-71-8P 133919-72-9P 142000-66-6P 142000-67-7P

142000-68-8P 142000-69-9P 142000-70-2P 142000-71-3P 142000-72-4P  
 142000-73-5P 142000-74-6P 142000-75-7P 142000-76-8P 142000-77-9P

RL: PREP (Preparation)

(prepn. of, for liq.-crystal media and display devices)

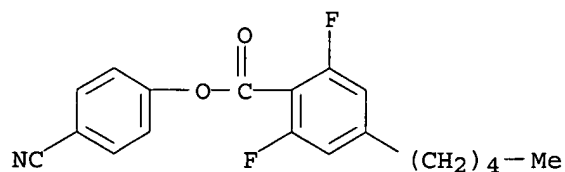
IT 123843-77-6P 123843-78-7P

RL: PREP (Preparation)

(prepn. of, for liq.-crystal media and display devices)

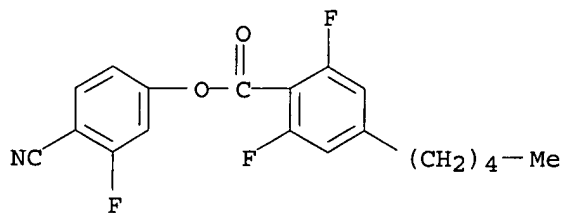
RN 123843-77-6 CAPLUS

CN Benzoic acid, 2,6-difluoro-4-pentyl-, 4-cyanophenyl ester (9CI) (CA INDEX NAME)



RN 123843-78-7 CAPLUS

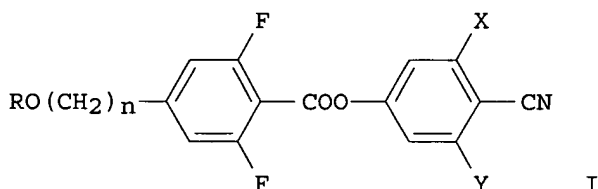
CN Benzoic acid, 2,6-difluoro-4-pentyl-, 4-cyano-3-fluorophenyl ester (9CI) (CA INDEX NAME)



AN 1999:378460 CAPLUS  
 DN 131:65975  
 TI Phenyl benzoate derivative, liquid crystal composition containing it, and liquid crystal display device using the composition  
 IN Takehara, Sadao; Ohsawa, Masashi; Takatsu, Haruyoshi  
 PA Dainippon Ink and Chemicals, Inc., Japan  
 SO Jpn. Kokai Tokkyo Koho, 10 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM C07C255-55  
 ICS C09K019-20; G02F001-13  
 CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 Section cross-reference(s): 25, 75

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11158138	A2	19990615	JP 1997-325972	19971127
PRAI	JP 1997-325972		19971127		
OS	MARPAT 131:65975				
GI					



AB The Ph benzoate deriv. is shown as I (R = C1-7 linear alkyl; n = 1-5; X, Y = H, F). The liq. crystal compn. contains I. The liq. crystal display device comprises the above compn. The compd. I shows good stability to heat, light, and water and gives liq. crystal compn. working in a wide temp. range to be esp. useful for super-twisted nematic liq. crystal displays.

ST phenyl benzoate liq crystal display STN; super twisted nematic liq crystal phenyl benzoate

IT Liquid crystal displays  
 (liq. crystal display device using Ph benzoate deriv.)

IT Liquid crystals  
 (nematic, super-twisted; liq. crystal display device using Ph benzoate deriv.)

IT 461-96-1  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (Grignard reaction with DMF; liq. crystal display device using Ph benzoate deriv.)

IT 82380-18-5, 3-Fluoro-4-cyanophenol  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (esterification with benzoyl chloride deriv.; liq. crystal display device using Ph benzoate deriv.)

IT 228122-43-8  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (esterification with fluorocyanophenol; liq. crystal display device using Ph benzoate deriv.)

IT 153680-01-4  
 RL: DEV (Device component use); PRP (Properties); USES (Uses)  
 (liq. crystal display device using Ph benzoate deriv.)

IT 228122-19-8P 228122-20-1P 228122-21-2P  
 228122-22-3P 228122-23-4P 228122-24-5P

228122-25-6P 228122-26-7P 228122-27-8P  
228122-28-9P 228122-29-0P 228122-30-3P  
228122-31-4P 228122-32-5P 228122-33-6P  
228122-34-7P 228122-35-8P 228122-36-9P  
228122-37-0P 228122-38-1P 228122-39-2P

RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(liq. crystal display device using Ph benzoate deriv.)

IT 228122-41-6P

RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(prepn. and acid chlorination of; liq. crystal display device using Ph benzoate deriv.)

IT 228122-40-5P

RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(prepn. and carboxylation of; liq. crystal display device using Ph benzoate deriv.)

IT 228122-42-7P

RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(prepn. and esterification with fluorocyanophenol; liq. crystal display device using Ph benzoate deriv.)

IT 79538-20-8P, 3,5-Difluorobenzyl alcohol

RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(prepn. and methylation of; liq. crystal display device using Ph benzoate deriv.)

IT 32085-88-4P, 3,5-Difluorobenzaldehyde

RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(prepn. and redn. of; liq. crystal display device using Ph benzoate deriv.)

IT 228122-19-8P 228122-20-1P 228122-21-2P

228122-22-3P 228122-23-4P 228122-24-5P

228122-25-6P 228122-26-7P 228122-27-8P

228122-28-9P 228122-29-0P 228122-30-3P

228122-31-4P 228122-32-5P 228122-33-6P

228122-34-7P 228122-35-8P 228122-36-9P

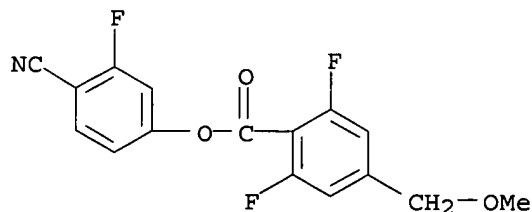
228122-37-0P 228122-38-1P 228122-39-2P

RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(liq. crystal display device using Ph benzoate deriv.)

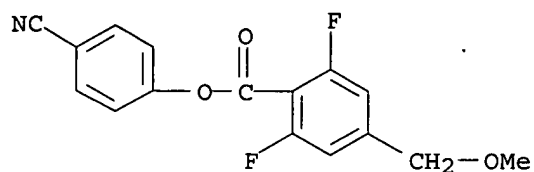
RN 228122-19-8 CAPLUS

CN Benzoic acid, 2,6-difluoro-4-(methoxymethyl)-, 4-cyano-3-fluorophenyl ester (9CI) (CA INDEX NAME)

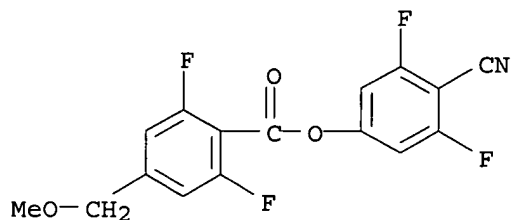


RN 228122-20-1 CAPLUS

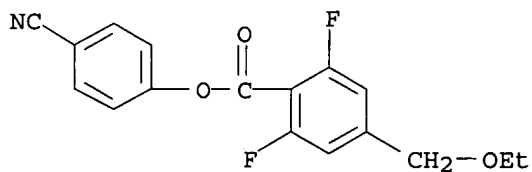
CN Benzoic acid, 2,6-difluoro-4-(methoxymethyl)-, 4-cyanophenyl ester (9CI) (CA INDEX NAME)



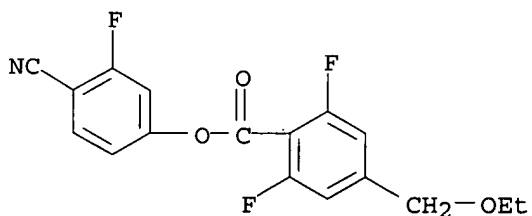
RN 228122-21-2 CAPLUS  
 CN Benzoic acid, 2,6-difluoro-4-(methoxymethyl)-, 4-cyano-3,5-difluorophenyl ester (9CI) (CA INDEX NAME)



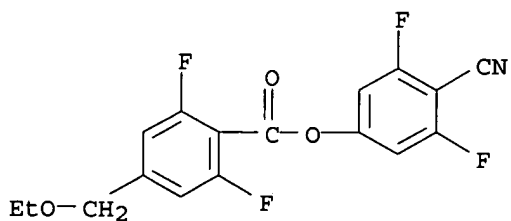
RN 228122-22-3 CAPLUS  
 CN Benzoic acid, 4-(ethoxymethyl)-2,6-difluoro-, 4-cyanophenyl ester (9CI) (CA INDEX NAME)

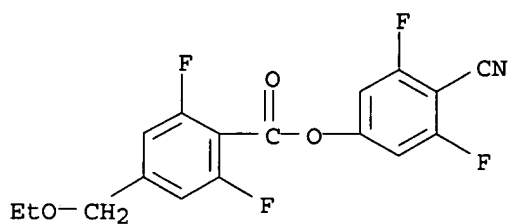


RN 228122-23-4 CAPLUS  
 CN Benzoic acid, 4-(ethoxymethyl)-2,6-difluoro-, 4-cyano-3-fluorophenyl ester (9CI) (CA INDEX NAME)



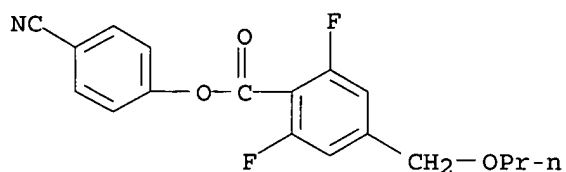
RN 228122-24-5 CAPLUS  
 CN Benzoic acid, 4-(ethoxymethyl)-2,6-difluoro-, 4-cyano-3,5-difluorophenyl ester (9CI) (CA INDEX NAME)





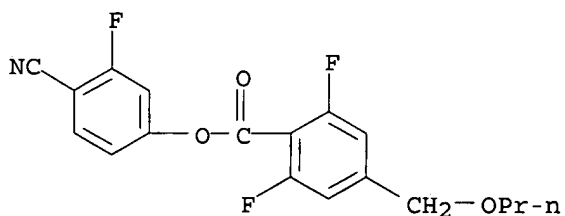
RN 228122-25-6 CAPLUS

CN Benzoic acid, 2,6-difluoro-4-(propoxymethyl)-, 4-cyanophenyl ester (9CI)  
(CA INDEX NAME)



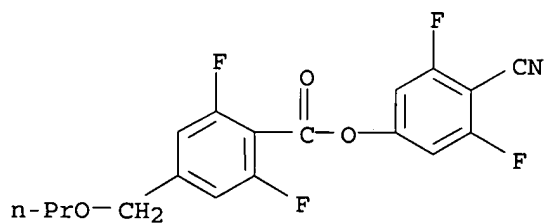
RN 228122-26-7 CAPLUS

CN Benzoic acid, 2,6-difluoro-4-(propoxymethyl)-, 4-cyano-3-fluorophenyl  
ester (9CI) (CA INDEX NAME)



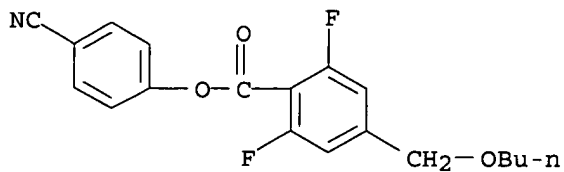
RN 228122-27-8 CAPLUS

CN Benzoic acid, 2,6-difluoro-4-(propoxymethyl)-, 4-cyano-3,5-difluorophenyl  
ester (9CI) (CA INDEX NAME)

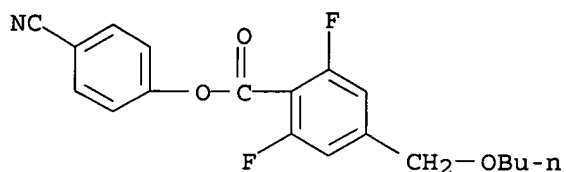


RN 228122-28-9 CAPLUS

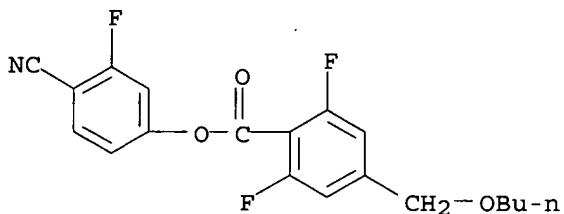
CN Benzoic acid, 4-(butoxymethyl)-2,6-difluoro-, 4-cyanophenyl ester (9CI)  
(CA INDEX NAME)



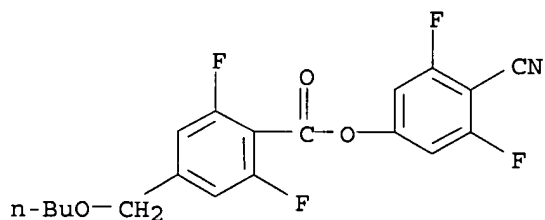




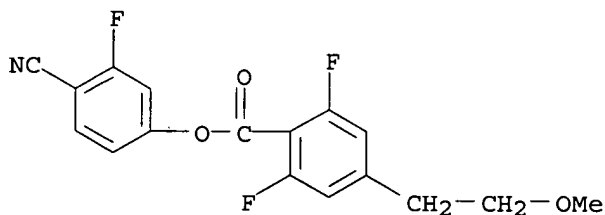
RN 228122-29-0 CAPLUS  
 CN Benzoic acid, 4-(butoxymethyl)-2,6-difluoro-, 4-cyano-3-fluorophenyl ester (9CI) (CA INDEX NAME)



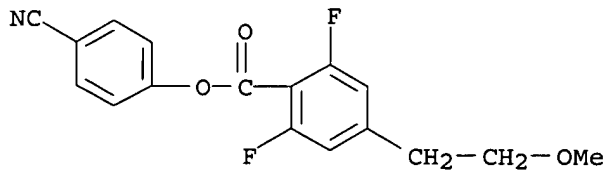
RN 228122-30-3 CAPLUS  
 CN Benzoic acid, 4-(butoxymethyl)-2,6-difluoro-, 4-cyano-3,5-difluorophenyl ester (9CI) (CA INDEX NAME)

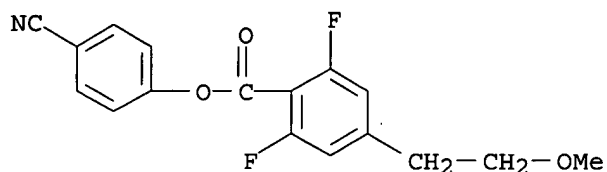


RN 228122-31-4 CAPLUS  
 CN Benzoic acid, 2,6-difluoro-4-(2-methoxyethyl)-, 4-cyano-3-fluorophenyl ester (9CI) (CA INDEX NAME)

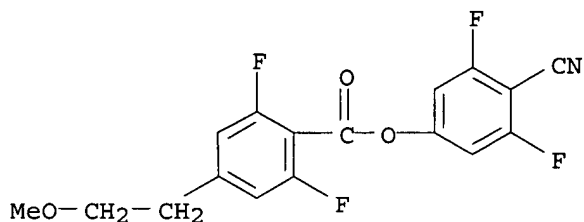


RN 228122-32-5 CAPLUS  
 CN Benzoic acid, 2,6-difluoro-4-(2-methoxyethyl)-, 4-cyanophenyl ester (9CI) (CA INDEX NAME)

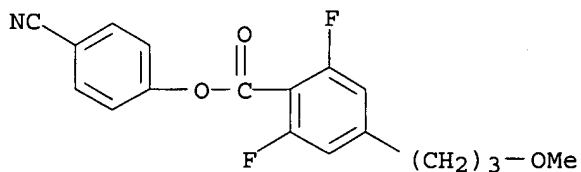




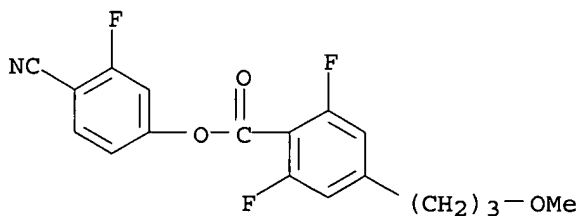
RN 228122-33-6 CAPLUS  
 CN Benzoic acid, 2,6-difluoro-4-(2-methoxyethyl)-, 4-cyano-3,5-difluorophenyl ester (9CI) (CA INDEX NAME)



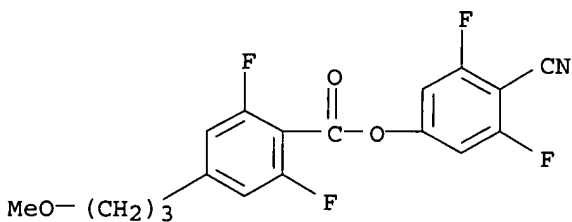
RN 228122-34-7 CAPLUS  
 CN Benzoic acid, 2,6-difluoro-4-(3-methoxypropyl)-, 4-cyanophenyl ester (9CI) (CA INDEX NAME)

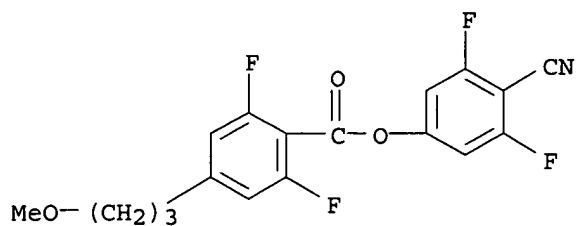


RN 228122-35-8 CAPLUS  
 CN Benzoic acid, 2,6-difluoro-4-(3-methoxypropyl)-, 4-cyano-3-fluorophenyl ester (9CI) (CA INDEX NAME)



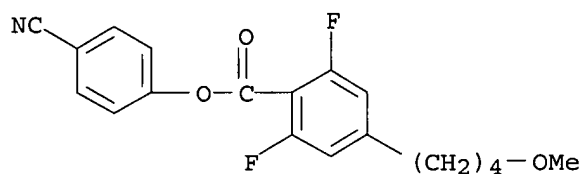
RN 228122-36-9 CAPLUS  
 CN Benzoic acid, 2,6-difluoro-4-(3-methoxypropyl)-, 4-cyano-3,5-difluorophenyl ester (9CI) (CA INDEX NAME)





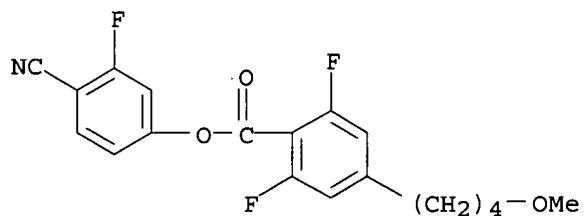
RN 228122-37-0 CAPLUS

CN Benzoic acid, 2,6-difluoro-4-(4-methoxybutyl)-, 4-cyanophenyl ester (9CI)  
(CA INDEX NAME)



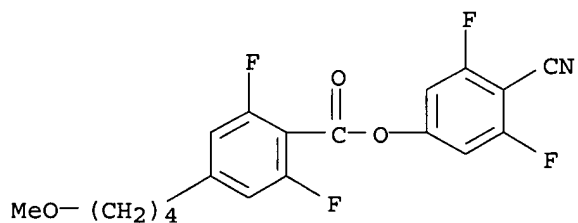
RN 228122-38-1 CAPLUS

CN Benzoic acid, 2,6-difluoro-4-(4-methoxybutyl)-, 4-cyano-3-fluorophenyl  
ester (9CI) (CA INDEX NAME)



RN 228122-39-2 CAPLUS

CN Benzoic acid, 2,6-difluoro-4-(4-methoxybutyl)-, 4-cyano-3,5-difluorophenyl  
ester (9CI) (CA INDEX NAME)



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(FILE 'HOME' ENTERED AT 18:06:16 ON 12 JAN 2003)

FILE 'REGISTRY' ENTERED AT 18:06:25 ON 12 JAN 2003

L1               STRUCTURE UPLOADED

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L3               110 S L1 FUL

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